

Relationship between Creativity and Tolerance of Ambiguity to Understand Metaphorical Polysemy: A Pilot Study

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Abstract

This study focuses on lexical ambiguity as polysemous words were proved to hinder meaning understanding. In an attempt to operationalize polysemous words from a cognitive perspective, the researcher deduces that metaphorical polysemy engenders words with basic and peripheral (or metaphorical) senses. Participants were asked to answer Multiple Stimulus Types Ambiguity Tolerance Scale II (MSTAT II). Then, they answered Wallach and Kogan Creativity Test, which revealed a slight positive relationship with MSTAT II. Furthermore, the results show two things. First, there is a positive relationship between creativity and semi-technical vocabulary tests scores. Second, there is a link between creativity level and understanding the prototypical meanings of words. Contrarily, MSTAT II and prototypical meanings tests scores correlation is very weak.

Keywords: Adult Language Learners, Multilingualism, Language Testing, Language Learning, Foreign Languages

1-Introduction

Nowadays, research about creativity is gaining ground throughout the world. The main stream of research signaled a shift in creativity definition. The pioneers assumed that this construct was a fundamental trait of gifted people for their scientific discoveries. Nowadays, this “supernatural” assumption is no longer feasible, as creativity studies have reached many contexts, the most considerable of which is the educational one.

Moreover, we are living in a world full of ambiguous situations. It is our inner ability to face ambiguity which facilitates our choices, that is Tolerance of Ambiguity. For instance, we can consider a new language as a new construct which cannot be deciphered unless the student is skillful at tolerating ambiguity. Some researchers from different disciplines like arts, business and languages focus on Tolerance of Ambiguity as a prerequisite for creativity. Few researchers have addressed the link between tolerance of ambiguity and creativity. Zenasni et al. (2008) mention the relatedness of creativity and tolerance of ambiguity. They do even consider tolerance of ambiguity as a personality trait that is involved in creativity. Although this relation has been proposed, empirical studies are rare.

It has to be noted that ESP context reveals more interesting findings at vocabulary level, as it encompasses technical, core and semi-technical vocabulary. In this study, I will tackle Business English. The language of business is different from the one of sciences and the one of general English. I think that Business English students should be aware of words polysemy.

As my aim is oriented towards finding the most suitable procedure to retain semi-technical vocabulary, Berendi's (2008) attempt to measure students' understanding of polysemous words via translation and prototype theory inspired me to make a comparison between the two.

First, I will shed light on creativity, multilingualism, semi-technical vocabulary and Business English throughout literature. Second, I will state the hypothesis. Then, I will move to methods of data collection, which are based on MSTAT II (The Multiple Stimulus Types Ambiguity Tolerance Scale II), Wallach and Kogan Creativity Test and Berendi et al's experiment. Next, results and discussion will be provided together with limitations and implications.

2- Review of Literature

2-1-Creativity

Although creativity definition may seem controversial, it is crucial in terms of today's concern over language learning and teaching strategies. In this regard, Cheng (2001) defines it mainly as: "The ability to produce work that is novel (i.e. original, unexpected), high in quality and appropriate (i.e. useful, meets task constraints) (Sternberg and Lubert (1999)". That's the overwhelming consensus which broadly identifies creativity. Moreover, some other researchers relate this construct to other disciplines like education. For instance, Carter (2016) maintains that: "The word creative does not now only collocate with "writing" or "literature" or "art" or "poetic", it collocates with an astonishing variety of concepts and words such as silence, business and professional". In brief, creativity is no longer pertaining only to literary and arts researches, but also to other research disciplines.

In this regard, Kaufman and Beghetto (2009) define "mini-c creativity" as the novel and personally meaningful interpretation of experiences, actions and events. They state that stereotyping creativity and considering it as "the belief that only the unusually prolific and lucky few have creative potential" is no longer acceptable. Building on from the previous ideas, this research illustrates that all students are naturally creative. However, they vary in creativity levels.

Within the realm of education, creativity was studied from different approaches. The most pervasive ones are mentioned by Plucker and Renzulli (1999):

- a) Psychometric methods: They define these methods as "the direct measurement of creativity and or its perceived correlates in individuals.
- b) The experimental approach: Where researchers tend to "isolate cognitive, problem-solving and product aspects of creativity for manipulation during experiments".
- c) The historiometric approach: or to draw quantitative data almost exclusively from historical documentation.
- d) The biographical approach or case study approach.

2-2- Creativity and multilingualism

Multilingualism has paved the way to many researchers to link it to other constructs like motivation, openness and intelligence, and creativity is not an exception. Many researchers have found that bilinguals and multilinguals tend to be creative due to their openness to cultures. In this regard, Kharkhurin (2012) maintains that acquiring two languages at an early age paves the way to connection between lexical and conceptual representations of both languages. Moreover, multilingual people's experience with many socio-cultural settings enhances their creative potential.

The researcher subsequently contends that language proficiency can stipulate a bilingual student's creative ability, as the more the student masters both languages the more s/he will show greater divergent thinking performance. Hence, divergent thinking is part and parcel of creative ability.

2-3- Tolerance of Ambiguity

A plethora of research aimed at defining tolerance of ambiguity or intolerance of ambiguity. In this regard, Zenasni et al. (2008) define it as: "Tolerance/Intolerance of ambiguity is generally considered to be a personality trait that corresponds to the way in which an individual tends to perceive and deal with ambiguous situations or stimuli. (Furnham (1994); Furnham and Avison (1997); Furnham and Ribchester (1995)). Thus, people who are intolerant of ambiguity feel constrained, anxious or tense in ambiguous situations.

McLain (2009) claims that: "At its heart, ambiguity is the timely absence of information needed to understand a situation or identify its possible future states. Ambiguity is therefore a lack of information beyond risk or uncertainty, which requires an awareness of all possible outcomes". In this regard, I suggest that a student who is facing words with multiple meanings is doomed to be in an ambiguous situation where he cannot find the most suitable meaning of the word in a specific context.

Conversely, Tuggy (1993) makes the distinction between ambiguity, polysemy and vagueness. His continuum is illustrated as: "Ambiguous meanings are (intuitively) quite separate, having little or nothing in common beyond the phonological structure they share, whereas vague meanings have so much in common that is difficult to separate. Cases of polysemy fall in between the two, the meanings are clearly distinguishable, yet also clearly related."

2-4- Semi-technical vocabulary: A cognitive perspective

As semi-technical words are polysemous, they have multiple meanings. Nerlich and Clarke (1999) maintain that polysemy should not be studied "in vitro" (decontextualized) but also "in vivo". They also distinguish "artificial" or "dead" polysemy from "live" polysemy (in daily interactions). From a pragmatic point of view, there is a principle of conventionality (Lehrer (1990), Clark (1993)). From a psycholinguistic point of view, polysemy is a semantic affair and we can disambiguate items by the principle of "relevance". In polysemy research, there is a widespread assumption that words in isolation can have more than one meaning, but that words in context always have one specific meaning.

In lexical semantics, polysemy, homonymy, ambiguity and vagueness relationships are not resolved. The word itself with its network of polysemous senses came to be regarded as a category in which the senses of a word (i.e. the members of the category) are related by means of general cognitive principles. In this regard, Verspoor and Lowie (2003) claim that: "We believe that a cognitive approach would also be effective in the teaching of different senses of polysemous words because it helps provide students with an opportunity to construct common sense interconnections between these different senses."

2-5- Business English from a general to a metaphorical perspective

Johnson (1993) distinguishes Business English from General English as it is different in terms of its lexis, semantic, prosody, clusters and the semantic "meaning world it is made up of". Thus, studying Business English vocabulary on its own is a crucial step towards facilitating its understanding by students. He does also claim that "The lexis of Business English has received little attention, academic or otherwise".

Pickett (1986) highlights the polysemous nature of Business English words as they take the core meaning of the general English and add an extra-meaning specific to the language of business.

My readings about Business English lexis reveal the importance of highlighting metaphors, in order to understand words. **For instance, "Wage freeze", "Cash flow" and "Career ladder" stand for the metaphorical aspect of Business English.** In this regard, Sacristán (2004) states that the aim of her paper is "to show that metaphor should be included in specific language programmes." She does also claim that "Research is being devoted to cross-cultural awareness (Hemais, 2001) and that "Cognitive Linguistics highlights the important role metaphor plays in Business English (Charteris-Black & Ennis, 2001)".

3- Hypothesis

If second year Business English students are creative and so able to tolerate ambiguity, they will understand metaphorical polysemous words in both prototype theory and translation tests.

4- Methods

There were four students participating in this sample. They are second year students of Applied License English in the Higher Institute of Languages in Gabés.

The participants were required to answer the Multiple Stimulus Types Ambiguity Tolerance Scale II (MSTAT II) according to a five point likert scale. McClain (2009) maintains that MSTAT II comprises 13 items (Appendix 1) and aims at measuring concisely an individual's cognitive orientation to avoid several types of ambiguous stimuli with acceptable reliability and validity. In fact, I used this scale as its reliability and validity were proven by many researchers (Arquero et al. 2017:5, Yee and Grobman 2016:2).

Subsequently, Wallach and Kogan Creativity Test (1965) (Appendix 2) were then used to calculate Tolerance of ambiguity-creativity correlation. For this study, I analyzed data collected from Wallach and Kogan Test instead of Torrance Tests of Creativity because Scholastic Testing Service has its own terms to provide researchers with TTCT, like being enrolled for a Doctorate. As this study precedes my thesis, I will opt for TTCT afterwards. It has to be noted that the choice of Wallach-Kogan tests is based on two criteria. On the one hand, similarly to TTCT, they are psychometric. On the other hand, as mentioned by Bayliss (2016), they are easily administered, assessed and scored by anyone and they don't necessitate any training.

As the goal of this research is to find the most suitable strategy to learn polysemous words or at least to help in understanding their core/ peripheral meanings according to their context, I concede that Berendi et al. (2008) 's experiment paves the way for such a goal. In their experiment, Berendi et al. tend to "examine whether explicit knowledge of the motivations behind (1) The multiple senses of polysemous words "hold" and "keep" and (2) idioms including these words help learners comprehend and remember these words better than other learners who learn the words via translation". In this study, I applied both methods i.e. learning the multiple senses of polysemous words via prototype theory and learning polysemous words via translation (English/French) in order to check whether the scores of prototype theory and translation tests depend on students' creativity and Ambiguity Tolerance levels or not.

Hence, a prototypical meanings test (Appendix 3) was administered. The students were required to learn the multiple meanings of "come up, fraction, odds, stanch, feet". These polysemous words are widely used in Business English. Then, the students sat for the test which included a text and two questions.

5- Results

Table 1 shows creativity test scores together with their sub-criteria: fluency, originality, flexibility and elaboration. This scoring scale was taken from Wallach and Kogan Creativity Test scoring. Mainly speaking, the scores range between 35 and 47. There is a considerable difference between sub-criteria scores as students got the highest scores in fluency and the least ones in elaboration. We can highlight that although these students seem to have a large amount of ideas, they can't provide a detailed description of their answers yielding to unrefined ideas.

Table 1: Creativity Test Scores

Students	Fluency	Originality	Flexibility	Elaboration	Scores
1	19	11	10	5	45
2	17	10	10	10	47
3	13	10	9	6	38
4	16	9	8	2	35

As far as tolerance of ambiguity is concerned, the scores range between 34 and 46. It has to be noted that the higher the score is, the more tolerant the student is. As likert scale was used, the reverse-scored items are rescored then I added the responses to all 13 items for a total score.

Table 2: Tolerance of Ambiguity Scores

Students	G	I	N	C	U	Total
1	13	9	10	8	4	34
2	7	6	5	4	2	46
3	14	5	8	7	5	41
4	16	11	9	8	4	40

Three students out of four almost got convergent results (40-41-46). They seem to be similarly tolerating ambiguity. The sub-criteria were calculated according to Mclain (2009)'s Tolerance of Ambiguity scale.

As far as Table 3 and figure 1 are concerned, there is a slight positive relationship between creativity and tolerance of ambiguity $r = +0.104$, $[0.0, 0.2]$.

Table 3: Creativity and Tolerance of Ambiguity Correlation

Creativity	Tolerance of Ambiguity
45	34
47	46
38	41
35	40
Correlation	0.104

Creativity/TA scatterplot shows an upward trend except for student 1 scores (Creativity = 45, TA= 34).

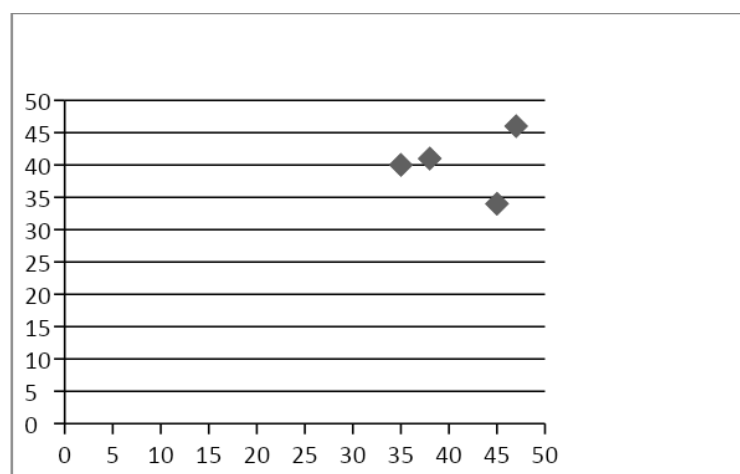


Figure 1: Creativity/TA Correlation

Tables 4 highlights translation tests scores ranging between 8 and 10.

Table 4: Translation Tests Scores

Students	Test Scores
1	8
2	10
3	9
4	9
Mean	9

Furthermore, Table 5 reflects a slight positive relationship between creativity and translation tests $r = +0.143$, [0.0, 0.2].

Table 5: Creativity / Translation Tests Correlation

Creativity	Translation Tests
45	8
47	10
38	9
35	9
Correlation	0,143

A look at table 6 reveals a very high relationship between tolerance of ambiguity and translation tests $r = 0.994$, [0.9, 1.0]. Thus, students with higher level of TA were able to find the correct answers.

Table 6: Tolerance of Ambiguity / Translation Tests Scores Correlation

Tolerance of Ambiguity	Translation Tests
34	8
46	10
41	9
40	9
Correlation	0.994

Table 7 shows prototypical meanings tests scores ranging between 8 and 10. Three students got 10 out of 10 and higher scores compared to translation tests.

Table 7: Prototypical Meanings Tests Scores

Students	Scores
1	10
2	10
3	10
4	8
Mean	9.5

Next, there is a high positive relationship between creativity and prototypical meanings tests $r = +0.733$ [0.6, 0.8].

Table 8: Creativity/ Prototypical Meanings Tests Correlation

Creativity	Prototypical Meanings
45	10
47	10
38	10
35	8
Correlation	0.733

In contrast, the relationship between tolerance of ambiguity and prototypical meanings tests is very weak $r = +0.033$ [0.0, 0.2].

Table 9: Tolerance of Ambiguity/ Prototypical Meanings Tests Scores Correlation

Tolerance of Ambiguity	Prototypical Meanings Tests
34	10
46	10
41	10
40	8
Correlation	0.033

6- Discussion

Our results demonstrated that the relationship between creativity and tolerance of ambiguity is positive but weak. In line with antecedent studies (Zenasni et al. (2008), it can be concluded that although creativity and tolerance of ambiguity are related, this idea should be reconsidered as the relationship is not high. This implies that tolerance of ambiguity can be a trait of a creative person, but it seems that there are other criteria which contribute more to creativity. Furthermore, the results show two things. First, there is a positive relationship between creativity and semi-technical vocabulary tests scores. Second, there is a clear support for the marked relationship between creativity level and understanding the prototypical meanings of words. Hence, the more the student is creative, the more he is able to grasp polysemous words in their context. Turning now to the relationship between TA and semi-technical vocabulary tests, the correlation between tolerance of ambiguity and translation tests scores is outstandingly high. This result is in line with Dewaele and Wei (2012) s' findings that learning languages has been linked to open mindedness and TA levels (p.232). Conversely, TA/ Prototypical meanings tests scores correlation is very weak. It seems that understanding prototypical meanings does not depend on one's TA level, as all meanings were presented in advance leaving no room for ambiguity. It has to be noted that the last sub-hypothesis was proven as prototypical meanings tests scores (mean=9.5) were higher than translation tests scores (mean = 9). It seems that giving students the different meanings of polysemous words facilitates their retention.

7- Limitations, implications and future research

Given the small population size, the findings should be generalized to a larger number of students. Moreover, I have to expand my Business English materials to administer longer tests and to check students' level as far as semi-technical vocabulary is concerned. Our approach could be applied to a larger study. First, Tolerance of ambiguity scale (MSTAT-II) was easily administered and scored by reference to Mclain (2009)'s research. Second, Wallach and Kogan Creativity Test (1965) proved to be flexible, detailed, easily scored and free. I think it is better to apply it for my future research due to the previously mentioned criteria together with its similarity to Torrance tests of creativity. The findings can be an initial step to calculate the correlation between the dependent and the independent variables. The sub-hypotheses proved to be testable.

8- Conclusion

This study focused on the relationship between creativity and tolerance of ambiguity together with the most suitable way to test and retain Business English semi-technical vocabulary. The results showed that there is a slight correlation between creativity and tolerance of ambiguity. Besides, the prototypical meanings of words helped students to deal with polysemous words. To conclude with, Business English is metaphorical entailing a detailed analysis of polysemous words categories should be the focus of our future research.

Appendix 1

Multiple Stimulus Types Ambiguity Tolerance Scale II (MSTAT II)

Item
1. I don't tolerate ambiguous situations well. ^c
2. I would rather avoid solving a problem that must be viewed from several different perspectives. ^c
3. I try to avoid situations that are ambiguous. ^c
4. I prefer familiar situations to new ones. ^c
5. Problems that cannot be considered from just one point of view are a little threatening. ^c
6. I avoid situations that are too complicated for me to easily understand. ^c
7. I am tolerant of ambiguous situations.
8. I enjoy tackling problems that are complex enough to be ambiguous.
9. I try to avoid problems that don't seem to have only one "best" solution. ^c
10. I generally prefer novelty over familiarity.
11. I dislike ambiguous situations. ^c
12. I find it hard to make a choice when the outcome is uncertain. ^c
13. I prefer a situation in which there is some ambiguity.

Appendix 2

Wallach–Kogan Creativity Test

1- Instances.

a) Name all the round things you can think of. (In the classroom)

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b) Name all the things you can think of that move on wheels.

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2. Alternative uses.

a) Tell all the different ways you could use a newspaper.

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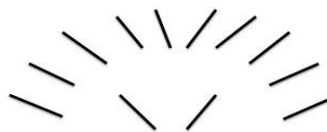
3. Similarities.

a) Tell all the ways in which a cat and a mouse are alike.

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4. Pattern meanings (Figural).

a) Tell all the things each complete drawing could be.



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5. Line meanings (Figural).



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Appendix 3: Prototypical Meanings Test

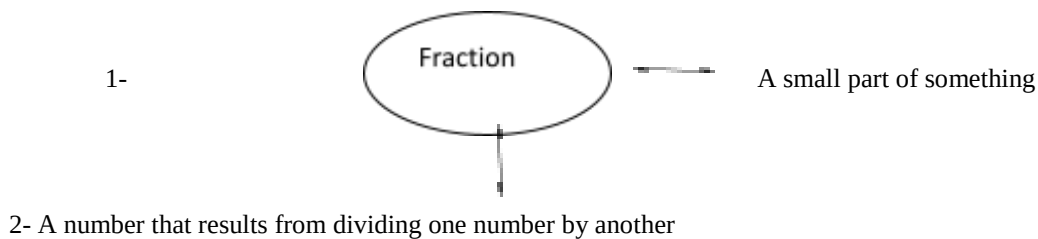
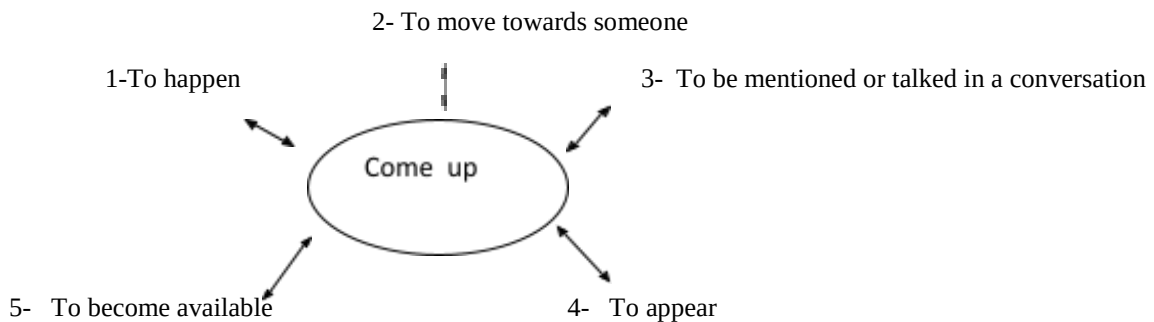
1) Read the conversation.

a: Good morning. Today's meeting is basically a brainstorming session to come up with solutions to the company's problems. As you know, sales this year are a fraction of what they were last year. We need to stanch the red ink and get the company back on its feet, so your input is welcome. The good news is that the odds of the present recession continuing into next year are low but ...

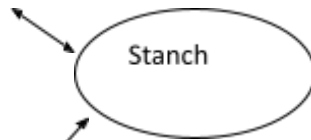
b: But we can't take that for granted, right?

a: Right.

2) Look at these words with multiple meanings.

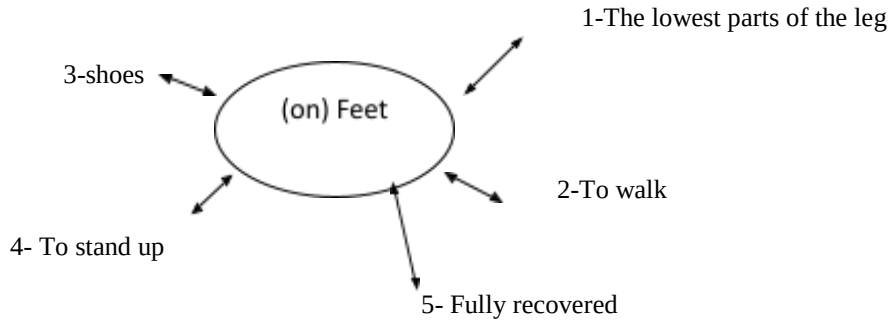


1-To stop liquid from flowing out.



2-Always loyal in supporting a person or a set of belief.

3-To stop something happening



1-The lowest parts of the leg

3-shoes

2-To walk

4- To stand up

5- Fully recovered

3-Put the correct word in the brackets.

1. Sales are down by 50% to only a of last year's figures.
2. Apple always seems to with interesting new products.
3. Cutting the company's energy consumption should help to the red ink and save money.
4. The an economic recovery this year? I'd say about 3 to 1.
5. Bernie's back on after his recent illness.

4- Match the idioms on the left with the appropriate situation on the right.

- | | |
|---|-------------------------------------|
| A) We need to stanch the red ink | 1) It has to find solutions. |
| B) Tom's back on his feet. | 2) The company is risking money. |
| C) The odds of the present recession are low. | 3) Let's stop the financial losses. |
| D) A fraction | 4) He's feeling fine after the flu. |
| E) The team has to come up with cost saving ideas | 5) 1/4, 1/2, 1/10, etc. |

Appendix 4: Translation Test

1) Read the text.

The latest dispute between management and labor resulted in a walk-out that shuttered most of the company for a week. However, the union agreed to a pay freeze in return for a halt to lay-offs. The company has agreed to overhaul its negotiating procedures and institute more worker-friendly policies. The only bright spot in the situation is that demand for the company's products seems to be picking up.

2) Look at these translated words.

- 1-A walk-out= grève
- 2-Shuttered= fermé (définitivement)
- 3- Pay freeze= gel des salaires
- 4-A halt= arrêt
- 5- Pick up= augmenter

6- Worker-friendly= convivial pour le travailleur

3) Put the correct idiom in the brackets.

(picking up / shuttered/ pay freeze/ walked out/halt)

- a) The workers downed tools and (.....) in the dispute with management.
- b) The company's trucks were (.....) after a series of break-downs.
- c) Sales are (.....) as people spend more.
- d) The (.....) was of course unpopular with the workers.
- e) (.....) policies help reduce the number of strikes.

4) Which of the following are worker-friendly policies?

- a) compulsory overtime
- b) better food in the canteen
- c) more safety training
- d) bigger bonuses for managers
- e) longer summer vacations

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Acknowledgement

I would like to express my gratitude to my supervisor Professor. Chokri Smaoui, who has been extremely tolerant and supportive. Without his support, this paper would not have been possible.

Special thanks also to Dr. Ivan Lowe as he has given me insightful comments.